



Indoor Air Quality Monitor

January 2003

 North Dakota Department of Health

Eye on Events

North Dakota Housing Conference

The North Dakota Housing Finance Agency (NDHFA) will hold its 12th Annual Statewide Housing Conference at the Seven Seas Inn in Mandan, N.D., Feb. 5 and 6, 2003. The conference will include a session on environmental issues facing single and multifamily properties. Attendees will have access to information available at various exhibitors' booths. For more information, contact NDHFA at 701.328.8056.

NDDoH offers Third Party Lead-Based Paint Tests

The North Dakota Department of Health is offering a third-party examination for lead-based paint certifications in all disciplines. The test will be held at the East Training Center in Bismarck Jan. 21, 2003. For more information, contact Ms. Sandi Washek at 701.328.5188.

Lead-Based Paint Hazards in Residences

Paint that contains 1.0 mg/cm² or 0.5 percent lead by weight is defined by Title X, the Residential Lead-Based Paint Hazard Reduction Act, as Lead-based paint.

Lead-based paint was banned for residential use in 1978. However, any home built before 1978 or painted with pre-1978 paint may contain lead-based paint. Due to the age, typical condition, and prevalence of lead in household paint at the time, homes built before 1960 are more likely to have higher levels of lead.

Lead was used in paint for its abilities to prevent corrosion, prevent mold growth, provide durability, add pigment and act as a drying agent.

Today we know that lead-based paint is poisonous. Lead can damage children's developing nervous systems, causing reduced IQ and learning disabilities.

Other health effects of lead poisoning in children and adults include anemia, high blood pressure, digestive

problems, kidney disease, nerve damage, brain damage, damage to blood cell formation, and even death. Lead poisoning also can cause premature births in pregnant women.

Lead poisoning can be difficult to recognize because the symptoms are similar to those felt when a person is ill from other causes. Symptoms of lead poisoning can include, but are not limited to, fatigue, dizziness, irritability, headaches, difficulty concentrating, weakness, loss of appetite, disorientation and vomiting.

Lead exposures typically occur through inhalation or ingestion. Lead-based paint becomes a hazard when lead dust is created. Lead dust from deteriorating lead-based paint can contaminate the air and any surface on which it lands. Children also may be exposed when they chew on accessible surfaces painted with lead-based paint such as window ledges or toys.

Lead is a higher risk to children for three primary



reasons: first, their hand-to-mouth behavior creates an increased potential for lead dust on surfaces to be ingested; second, they absorb almost 50percent of the lead they take in; and third, their nervous systems are not completely developed and are more prone to damage.

Lead can stay in the body for a long time. It can remain in the blood for several months and can be stored in bones for years.

(Paint ... cont. page 2)

Inside This Issue ...

Eye on Events.....	1
Lead-Based Paint Hazards in Residences.....	1
Other Residential Lead Hazards.....	2
IAQ Colleague.....	2
Tool Talk: IAQ Equipment Review.....	3

(Paint cont. from page 1)

People who think they have lead poisoning should seek medical attention immediately.

Paint must be tested by a trained and certified professional to determine if it contains lead.

Never disturb a surface that is painted with lead-based paint. Sanding, cutting,

scraping or otherwise disturbing lead-based paint should be conducted by properly trained and certified individuals wearing protective equipment and using engineering controls designed to reduce emissions.

The North Dakota Department of Health, Lead-based Paint Program, ensures

that lead-based paint in child-occupied facilities built before 1978 are properly managed to minimize lead exposure to workers and the public. The program licenses and certifies lead-based paint inspectors, workers and trainers. For more information, contact Sandi Washek at 701.328.5188.

Other Residential Lead Hazards

Lead-based paint is not the only source of lead that people can be exposed to in a home. Some household items and hobbies may pose a lead exposure risk to people.

Older plumbing fixtures, lead pipes and pipes connected with lead solder can contaminate drinking water. The amount of lead to leach into water from these items depends upon how long the water stays in the pipes, the condition of the pipes, the pH of the water and the temperature.

Lead-glazed ceramic ware and pottery can contaminate food and liquids served from them. Hobbyists who enjoy making glazed pottery can be exposed to lead in the fumes created.



Some ceramic-ware and pottery may be lead-glazed

Lead fumes also can be generated from burning candles with lead wicks. Consult the manufacturer's label to ensure that candle wicks are lead free before purchasing or using candles.

Some imported, non-glossy, vinyl mini-blinds can pose a lead exposure risk. Heat can break down the blinds and release lead-contaminated dust.

Working with stained glass can involve contact with lead fumes and dust. Lead fumes are generated when solder that contains lead is



Working with stained glass can create lead fumes

melted. In addition, lead dust can be generated from sawing old stained glass window frames. The plaster and fillings around the stained glass also may be a health hazard as they might have absorbed lead over the years.

When acidic beverages are stored in lead-crystal containers, some lead can dissolve into the liquid. The amount of lead to be dissolved depends on the lead content of the crystal, the type of beverage, and the length of time they are in contact with each other. However, the amount of lead obtained from crystal is generally very small.

Other exposures to lead can occur when working with batteries or when making lead bullets or lead fishing sinkers. Also, pinewood derby cars often use lead to add weight to the cars.

For more information, contact Sandi Washek at 701.328.5188.



Lead crystal may leach lead

IAQ Colleague



Sandi with her niece, Morgie, and dog, Lady-Girl

This issue's IAQ colleague is Sandi Washek, Lead-Based Paint Program coordinator at the North Dakota Department of Health (NDDoH).

Sandi received a bachelor's degree in earth science from Minot State University (MSU). She was born in Minot, N.D., and raised in Sawyer, N.D.

Before moving to her current position with NDDoH, Sandi was the Radon Program coordinator. She worked for Iron County Soil and Water Conservation District in Michigan before joining the NDDoH and also taught geology at MSU.

Sandi enjoys helping people and also appreciates the many challenges that environmental health work can offer.

Outside of the office, Sandi enjoys quilting and the outdoor hobbies of hunting, fishing and camping.

Sandi said she even involves her coworkers with her quilting.

"Every so often," Sandi said, "I bring my work into the office and we have a good old fashioned quilt pull."

Tool Talk: Indoor Air Quality Equipment Review

An x-ray fluorescence (XRF) device is a useful indoor environmental instrument.

XRF devices are used to analyze the metal content of a material. They are widely used in the petroleum, plastics, food, pharmaceutical, cosmetics and environmental industries.

For public health work, an XRF device is a valuable instrument for detecting the lead content of a material such as paint. An XRF analyzer makes lead testing more easy and convenient. Testing with an XRF analyzer is nondestructive to the component being tested. Nondestructive testing becomes especially important when dealing with materials such as dishware. In addition, there is no lab turnaround time for an

XRF analyzer because the results are provided to the user immediately.

In order to understand how an XRF functions to detect lead in a material, one must understand some atomic fundamentals.

The Bohr model describes an atom as being a dense nucleus of positively charged protons and neutrons surrounded by concentric shells of negatively charged electrons.

Energy can remove electrons from their shells. More energy is required to dislodge electrons from inner shells than outer shells. When an electron from an inner shell is removed, an electron from an outer shell moves into its place. The latter movement, referred to as fluorescence, is accompanied by a release

of energy from the

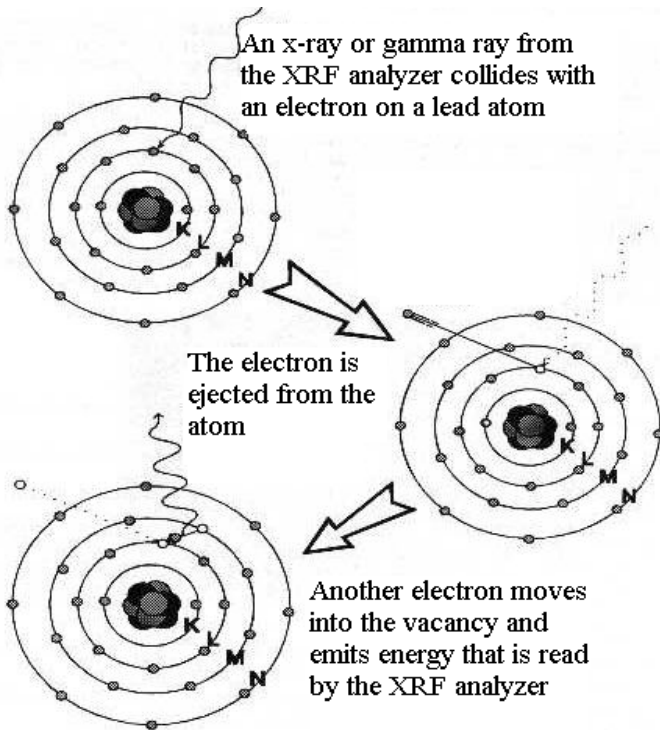
atom. The energy released is unique to the atom. Therefore, an atom of lead can be distinguished from another atom by the energy it emits during fluorescence.

For the detection of lead, XRF analyzers work by emitting a specific wavelength of high energy x-ray and gamma ray radiation from a radioactive source within the device. The energy emitted is designed to be enough to dislodge electrons from the inner shells of the lead

atoms.

The XRF then measures the energy emitted from the lead atoms as its outer shell electrons fill in the vacancies. The quantity of lead is usually given in micrograms (μg) per square centimeter (cm^2). Lead-based paint is defined as paint that contains $1.0 \mu\text{g}/\text{cm}^2$ or greater lead content.

Since an XRF device contains radioactive material, it is regulated by the North Dakota Department of Health. A radioactive material license is required in order to manufacture, produce, transfer, receive, acquire, own, possess, store or use radioactive material in North Dakota. For information regarding licensing of radioactive materials in North Dakota, contact Justin Griffin or Jim Killingbeck of the Radiation Control Program at 701.328.5188.



The Indoor Air Quality Monitor is published quarterly by the North Dakota Department of Health, Indoor Air Quality Program.

Dr. Terry Dwelle, State Health Officer
Dave Glatt, Chief, Environmental Health Section
Terry O'Clair, Director, Division of Air Quality
Ken Wangler, Manager, Indoor Air Quality Program
Editor: Jesse Green, Indoor Air Quality Program



North Dakota Department of Health
Division of Air Quality
1200 Missouri Ave., Box 5520
Bismarck, N.D. 58505
701.328.5188

Questions? Comments? Suggestions? Something to add to the next issue? Call Jesse Green at 701.328.5188